

Full SAP Calculation Printout



Plot Reference	UNIT 13			Issued on Date	08/07/2026
Assessment Reference	001	Plot Type Ref	UNIT 13		
Plot Address	UNIT 13, Stoney Wood Quarter, 34 The Fairway, LONDON, NW7 3HS			SAP Version	10.2
SAP Rating	84 B	DER	15.04	TER	16.23
Environmental	87 B	% DER < TER			7.33
CO ₂ Emissions (t/year)	1.26	DFEE	50.75	TFEE	52.67
Compliance Check	See BREL	% DFEE < TFEE			3.66
% DPER < TPER	1.86	DPER	84.83	TPER	86.43
Assessor Details	Mr. Ondrej Gajdos			Assessor ID	W452-0001
Client					

SAP 10 WORKSHEET FOR New Build (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	93.2000 (1b)	2.9000 (2b)	270.2800 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	93.2000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	270.2800 (5)

2. Ventilation rate

	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	0 * 10 = 0.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)

Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	0.0000 / (5) =	0.0000 (8)
Pressure test	Yes	
Pressure Test Method	Blower Door	
Measured/design AP50	3.0000	(17)
Infiltration rate	0.1500	(18)
Number of sides sheltered	3	(19)

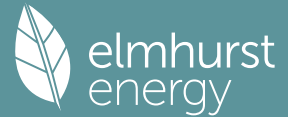
Shelter factor	(20) = 1 - [0.075 x (19)] =	0.7750 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =	0.1162 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.1482	0.1453	0.1424	0.1279	0.1250	0.1104	0.1104	0.1075	0.1162	0.1250	0.1308	0.1366 (22b)
Balanced mechanical ventilation with heat recovery												
If mechanical ventilation												0.5000 (23a)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)												0.5000 (23b)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												81.0000 (23c)
Effective ac	0.2432	0.2403	0.2374	0.2229	0.2200	0.2054	0.2054	0.2025	0.2112	0.2200	0.2258	0.2316 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
dl			1.8900	1.0000	1.8900		(26)
l			46.8700	0.7940	37.2128		(27)
corridor below			0.7000	0.0900	0.0630	75.0000	52.5000 (28b)
exposed wall	90.4800	46.8700	43.6100	0.1500	6.5415	60.0000	2616.6002 (29a)
corridor wall	15.3700	1.8900	13.4800	0.3100	4.1788	14.0000	188.7200 (29a)
stair wall	18.8500		18.8500	0.2000	3.7700	9.0000	169.6500 (29a)
flat roof	93.2000		93.2000	0.1000	9.3200	9.0000	838.8000 (30)
Total net area of external elements A _{um} (A, m ²)			218.6000				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	62.9761		(33)
Main dwelling							
pw			31.6100	0.0000	0.0000	110.0000	3477.1001 (32)
pf			92.5000			40.0000	3700.0000 (32d)
iw			204.1600			9.0000	1837.4400 (32c)
Heat capacity C _m = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	12880.8103 (34)

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Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K

138.2061 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total
E2 Other lintels (including other steel lintels)	18.4600	0.0500	0.9230
E3 Sill	17.5600	0.0500	0.8780
E4 Jamb	61.2000	0.0500	3.0600
E7 Party floor between dwellings (in blocks of flats)	28.0000	0.0700	1.9600
E23 Balcony within or between dwellings, balcony support penetrates wall insulation	4.1000	0.0200	0.0820
E24 Eaves (insulation at ceiling level - inverted)	10.7000	0.0800	0.8560
E15 Flat roof with parapet	31.4000	0.5600	17.5840
E16 Corner (normal)	11.6000	0.0900	1.0440
E17 Corner (inverted - internal area greater than external area)	11.6000	-0.0900	-1.0440
E18 Party wall between dwellings	11.6000	0.0600	0.6960
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			26.0390 (36)
Point Thermal bridges			0.0000
Total fabric heat loss		(33) + (36) + (36a) =	89.0151 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(38)m	21.6933	21.4340	21.1748	19.8788	19.6195	18.3235	18.3235	18.0642	18.8419	19.6195	20.1380	20.6564 (38)
Heat transfer coeff	110.7084	110.4492	110.1900	108.8939	108.6347	107.3386	107.3386	107.0794	107.8570	108.6347	109.1531	109.6715 (39)
Average = Sum(39)m / 12 =												108.8291
HLP	1.1879	1.1851	1.1823	1.1684	1.1656	1.1517	1.1517	1.1489	1.1573	1.1656	1.1712	1.1767 (40)
HLP (average)												1.1677
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.6670 (42)
Hot water usage for mixer showers	68.9372	67.9012	66.3916	63.5031	61.3715	58.9944	57.6433	59.1415	60.7838	63.3361	66.2866	68.6731 (42a)
Hot water usage for baths	29.7685	29.3264	28.7038	27.5559	26.6963	25.7432	25.2284	25.8466	26.5198	27.5396	28.7112	29.6678 (42b)
Hot water usage for other uses	41.9431	40.4179	38.8927	37.3675	35.8423	34.3171	34.3171	35.8423	37.3675	38.8927	40.4179	41.9431 (42c)
Average daily hot water use (litres/day)												129.2880 (43)
Daily hot water use	140.6488	137.6455	133.9881	128.4265	123.9102	119.0548	117.1888	120.8304	124.6711	129.7685	135.4157	140.2840 (44)
Energy conte	222.7533	196.0054	205.9347	175.8095	166.8069	146.3917	141.7297	149.6133	153.7319	176.0946	192.9245	219.6509 (45)
Energy content (annual)										Total = Sum(45)m =		2147.4464
Distribution loss (46)m = 0.15 x (45)m	33.4130	29.4008	30.8902	26.3714	25.0210	21.9588	21.2595	22.4420	23.0598	26.4142	28.9387	32.9476 (46)
Water storage loss (or HIU loss):												
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
If cylinder contains dedicated solar storage												
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
Combi loss	50.9589	46.0274	50.9589	49.3151	50.9589	49.3151	50.9589	50.9589	49.3151	50.9589	49.3151	50.9589 (61)
Total heat required for water heating calculated for each month	273.7122	242.0328	256.8936	225.1246	217.7658	195.7068	192.6886	200.5722	203.0470	227.0535	242.2395	270.6098 (62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)
Output from w/h	273.7122	242.0328	256.8936	225.1246	217.7658	195.7068	192.6886	200.5722	203.0470	227.0535	242.2395	270.6098 (64)
12Total per year (kWh/year)										Total per year (kWh/year) = Sum(64)m =		2747.4464 (64)
Electric shower(s)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)
Heat gains from water heating, kWh/month	86.8052	76.6786	81.2130	70.7854	68.2030	61.0040	59.8648	62.4861	63.4446	71.2912	76.4762	85.7737 (65)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000 (64a)

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	123.4953	136.7270	123.4953	127.6118	123.4953	127.6118	123.4953	123.4953	127.6118	123.4953	127.6118	123.4953 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	244.8433	247.3840	240.9815	227.3513	210.1457	193.9748	183.1717	180.6310	187.0335	200.6636	217.8693	234.0402 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352 (69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815 (71)
Water heating gains (Table 5)	116.6737	114.1051	109.1573	98.3131	91.6707	84.7278	80.4635	83.9868	88.1175	95.8215	106.2169	115.2872 (72)
Total internal gains	551.0178	564.2216	539.6396	519.2818	491.3173	469.3200	450.1361	451.1186	465.7684	485.9860	517.7035	538.8282 (73)

6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W
North	7.2700	10.6334	0.5300	0.7000	0.7700	19.8753 (74)
Northeast	25.5700	11.2829	0.5300	0.7000	0.7700	74.1754 (75)
Southeast	10.7900	36.7938	0.5300	0.7000	0.7700	102.0713 (77)
Northwest	3.2400	11.2829	0.5300	0.7000	0.7700	9.3988 (81)

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Solar gains	205.5209	381.9657	608.9301	901.7862	1146.4189	1198.6092	1130.3805	938.2912	708.6577	445.2690	251.9347	172.1717	(83)
Total gains	756.5387	946.1874	1148.5697	1421.0680	1637.7362	1667.9292	1580.5165	1389.4098	1174.4261	931.2550	769.6382	710.9999	(84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)													21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	32.3192	32.3950	32.4712	32.8577	32.9361	33.3338	33.3338	33.4145	33.1736	32.9361	32.7797	32.6247	
alpha	3.1546	3.1597	3.1647	3.1905	3.1957	3.2223	3.2223	3.2276	3.2116	3.1957	3.1853	3.1750	
util living area	0.9639	0.9313	0.8676	0.7318	0.5588	0.3976	0.2945	0.3464	0.5709	0.8294	0.9398	0.9696	(86)
MIT	19.0291	19.4196	19.9400	20.5086	20.8313	20.9578	20.9879	20.9798	20.8690	20.3669	19.5959	18.9638	(87)
Th 2	19.9297	19.9320	19.9342	19.9454	19.9476	19.9588	19.9588	19.9611	19.9543	19.9476	19.9431	19.9387	(88)
util rest of house	0.9572	0.9195	0.8461	0.6945	0.5079	0.3375	0.2266	0.2714	0.5011	0.7935	0.9273	0.9639	(89)
MIT 2	17.6570	18.1454	18.7838	19.4552	19.8018	19.9307	19.9534	19.9513	19.8565	19.3191	18.3814	17.5805	(90)
Living area fraction												0.2876	(91)
MIT	18.0515	18.5118	19.1163	19.7581	20.0978	20.2260	20.2509	20.2471	20.1477	19.6204	18.7306	17.9783	(92)
Temperature adjustment												-0.1500	
adjusted MIT	17.9015	18.3618	18.9663	19.6081	19.9478	20.0760	20.1009	20.0971	19.9977	19.4704	18.5806	17.8283	(93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9398	0.8971	0.8230	0.6815	0.5079	0.3444	0.2360	0.2814	0.5041	0.7745	0.9061	0.9481	(94)
Useful gains	711.0098	848.8393	945.2600	968.4590	831.8415	574.4131	372.9749	390.9348	592.0841	721.2699	697.3967	674.1043	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	1505.8027	1486.8489	1373.6575	1166.0509	896.0019	587.7892	375.7789	395.8796	636.1037	963.6376	1253.1442	1494.6312	(97)
Space heating kWh	591.3259	428.7424	318.7277	142.2662	47.7353	0.0000	0.0000	0.0000	0.0000	180.3215	400.1382	610.4720	(98a)
Space heating requirement - total per year (kWh/year)												2719.7293	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	591.3259	428.7424	318.7277	142.2662	47.7353	0.0000	0.0000	0.0000	0.0000	180.3215	400.1382	610.4720	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												2719.7293	
Space heating per m2										(98c) / (4) =		29.1816	(99)

9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													88.9000 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	591.3259	428.7424	318.7277	142.2662	47.7353	0.0000	0.0000	0.0000	0.0000	180.3215	400.1382	610.4720	(98)
Space heating efficiency (main heating system 1)	88.9000	88.9000	88.9000	88.9000	88.9000	0.0000	0.0000	0.0000	0.0000	88.9000	88.9000	88.9000	(210)
Space heating fuel (main heating system)	665.1585	482.2750	358.5239	160.0295	53.6955	0.0000	0.0000	0.0000	0.0000	202.8364	450.0992	686.6952	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	273.7122	242.0328	256.8936	225.1246	217.7658	195.7068	192.6886	200.5722	203.0470	227.0535	242.2395	270.6098	(64)
Efficiency of water heater	85.9861	85.5924	84.8447	83.4251	81.7214	80.3000	80.3000	80.3000	80.3000	83.8923	85.4490	80.3000	(216)
Fuel for water heating, kWh/month	318.3214	282.7737	302.7810	269.8523	266.4736	243.7195	239.9609	249.7786	252.8605	270.6488	283.4902	314.4107	(219)
Space cooling fuel requirement													
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	22.8900	20.6748	22.8900	22.1516	22.8900	22.1516	22.8900	22.8900	22.1516	22.8900	22.1516	22.8900	(231)
Lighting	25.6599	20.5853	18.5348	13.5794	10.4891	8.5697	9.5685	12.4375	16.1551	21.1964	23.9413	26.3731	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1												3059.3130	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												80.3000	
Water heating fuel used												3295.0710	(219)
Space cooling fuel												0.0000	(221)
Electricity for pumps and fans:													
(BalancedWithHeatRecovery, Database: in-use factor = 1.1000, SFP = 0.6930)													
mechanical ventilation fans (SFP = 0.6930)												228.5109	(230a)

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central heating pump 41.0000 (230c)
 Total electricity for the above, kWh/year 269.5109 (231)
 Electricity for lighting (calculated in Appendix L) 207.0900 (232)

Energy saving/generation technologies (Appendices M ,N and Q)
 PV generation 0.0000 (233)
 Wind generation 0.0000 (234)
 Hydro-electric generation (Appendix N) 0.0000 (235a)
 Electricity generated - Micro CHP (Appendix N) 0.0000 (235)
 Appendix Q - special features
 Energy saved or generated -0.0000 (236)
 Energy used 0.0000 (237)
 Total delivered energy for all uses 6830.9850 (238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year
Space heating - main system 1	3059.3130	0.2100	642.4557 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	3295.0710	0.2100	691.9649 (264)
Space and water heating			1334.4207 (265)
Pumps, fans and electric keep-hot	269.5109	0.1387	37.3845 (267)
Energy for lighting	207.0900	0.1443	29.8895 (268)
Total CO2, kg/year			1401.6946 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			15.0400 (273)

13a. Primary energy - Individual heating systems including micro-CHP

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Space heating - main system 1	3059.3130	1.1300	3457.0237 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	3295.0710	1.1300	3723.4303 (278)
Space and water heating			7180.4540 (279)
Pumps, fans and electric keep-hot	269.5109	1.5128	407.7161 (281)
Energy for lighting	207.0900	1.5338	317.6415 (282)
Total Primary energy kWh/year			7905.8117 (286)
Dwelling Primary energy Rate (DPER)			84.8300 (287)

SAP 10 WORKSHEET FOR New Build (As Designed) (Version 10.2, February 2022)
 CALCULATION OF TARGET EMISSIONS

1. Overall dwelling characteristics

	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling	93.2000 (1b)	2.9000 (2b)	270.2800 (1b) - (3b)
Ground floor			(4)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	93.2000		270.2800 (5)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	

2. Ventilation rate

	m3 per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	3 * 10 = 30.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	30.0000 / (5) = 0.1110 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	5.0000 (17)
Infiltration rate	0.3610 (18)
Number of sides sheltered	3 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.7750 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.2798 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.3567	0.3497	0.3427	0.3077	0.3008	0.2658	0.2658	0.2588	0.2798	0.3008	0.3147	0.3287 (22b)
Effective ac	0.5636	0.5612	0.5587	0.5474	0.5452	0.5353	0.5353	0.5335	0.5391	0.5452	0.5495	0.5540 (25)

3. Heat losses and heat loss parameter

5. Internal gains (see Table 5 and 5a)													

Metabolic gains (Table 5), Watts													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518	133.3518	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	123.4953	136.7270	123.4953	127.6118	123.4953	127.6118	123.4953	123.4953	127.6118	123.4953	127.6118	123.4953	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	244.8433	247.3840	240.9815	227.3513	210.1457	193.9748	183.1717	180.6310	187.0335	200.6636	217.8693	234.0402	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352	36.3352	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	-106.6815	(71)
Water heating gains (Table 5)	116.6737	114.1051	109.1573	98.3131	91.6707	84.7278	80.4635	83.9868	88.1175	95.8215	106.2169	115.2872	(72)
Total internal gains	551.0178	564.2216	539.6396	519.2818	491.3173	469.3200	450.1361	451.1186	465.7684	485.9860	517.7035	538.8282	(73)

[Jan]					Area	Solar flux	g		FF	Access		Gains
					m2	Table 6a	Specific data		Specific data	factor		W
						W/m2	or Table 6b		or Table 6c	Table 6d		
North					3.3200	10.6334	0.6300		0.7000	0.7700		10.7890 (74)
Northeast					11.6900	11.2829	0.6300		0.7000	0.7700		40.3096 (75)
Southeast					4.9300	36.7938	0.6300		0.7000	0.7700		55.4362 (77)
Northwest					1.4800	11.2829	0.6300		0.7000	0.7700		5.1034 (81)
Solar gains	111.6382	207.4862	330.7832	489.8797	622.7800	651.1346	614.0688	509.7135	384.9611	241.8753	136.8507	93.5226 (83)
Total gains	662.6560	771.7078	870.4228	1009.1615	1114.0973	1120.4546	1064.2049	960.8321	850.7295	727.8613	654.5543	632.3508 (84)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	26.8959	26.9405	26.9844	27.1924	27.2317	27.4161	27.4161	27.4505	27.3448	27.2317	27.1524	27.0699
alpha	2.7931	2.7960	2.7990	2.8128	2.8154	2.8277	2.8277	2.8300	2.8230	2.8154	2.8102	2.8047
util living area	0.9758	0.9622	0.9374	0.8768	0.7710	0.6230	0.4917	0.5501	0.7600	0.9128	0.9636	0.9787 (86)
MIT	18.4010	18.6954	19.1715	19.8281	20.3982	20.7720	20.9152	20.8819	20.5744	19.8361	19.0113	18.3506 (87)
Th 2	19.7424	19.7442	19.7460	19.7543	19.7558	19.7631	19.7631	19.7645	19.7603	19.7558	19.7527	19.7494 (88)
util rest of house	0.9709	0.9545	0.9240	0.8495	0.7187	0.5350	0.3711	0.4281	0.6853	0.8875	0.9548	0.9743 (89)
MIT 2	16.7547	17.1278	17.7275	18.5404	19.2076	19.6045	19.7251	19.7063	19.4246	18.5709	17.5378	16.6947 (90)
Living area fraction									fLA = Living area / (4) =			0.2876 (91)
MIT	17.2281	17.5786	18.1427	18.9107	19.5500	19.9402	20.0673	20.0444	19.7552	18.9347	17.9615	17.1709 (92)
Temperature adjustment												0.0000
adjusted MIT	17.2281	17.5786	18.1427	18.9107	19.5500	19.9402	20.0673	20.0444	19.7552	18.9347	17.9615	17.1709 (93)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9560	0.9355	0.9011	0.8267	0.7088	0.5487	0.4026	0.4579	0.6850	0.8655	0.9366	0.9606	(94)
Useful gains	633.4898	721.9528	784.2976	834.2702	789.7094	614.7905	428.4274	439.9454	582.7439	629.9850	613.0325	607.4568	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	1719.8475	1683.8572	1543.7735	1317.2156	1031.4141	696.9337	452.5093	475.0208	739.9708	1095.1047	1431.2752	1714.4456	(97)
Space heating kWh	808.2502	646.3998	565.0501	347.7207	179.8283	0.0000	0.0000	0.0000	0.0000	346.0491	589.1348	823.5996	(98a)
Space heating requirement - total per year (kWh/year)												4306.0325	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	808.2502	646.3998	565.0501	347.7207	179.8283	0.0000	0.0000	0.0000	0.0000	346.0491	589.1348	823.5996	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												4306.0325	
Space heating per m2											(98c) / (4) =	46.2021	(99)

Fraction of space heat from secondary/supplementary system (Table 11)	0.0000	(201)
Fraction of space heat from main system(s)	1.0000	(202)
Efficiency of main space heating system 1 (in %)	92.4000	(206)
Efficiency of main space heating system 2 (in %)	0.0000	(207)
Efficiency of secondary/supplementary heating system, %	0.0000	(208)

[illegible][illegible]

Full SAP Calculation Printout



(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1												4660.2083	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												80.3000	
Water heating fuel used												2911.9897	(219)
Space cooling fuel												0.0000	(221)
Electricity for pumps and fans:													
Total electricity for the above, kWh/year												86.0000	(231)
Electricity for lighting (calculated in Appendix L)												207.0900	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation												-921.3287	(233)
Wind generation												0.0000	(234)
Hydro-electric generation (Appendix N)												0.0000	(235a)
Electricity generated - Micro CHP (Appendix N)												0.0000	(235)
Appendix Q - special features													
Energy saved or generated												-0.0000	(236)
Energy used												0.0000	(237)
Total delivered energy for all uses												6943.9593	(238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	4660.2083	0.2100	978.6437	(261)
Total CO2 associated with community systems			0.0000	(373)
Water heating (other fuel)	2911.9897	0.2100	611.5178	(264)
Space and water heating			1590.1616	(265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293	(267)
Energy for lighting	207.0900	0.1443	29.8895	(268)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-509.0377	0.1334	-67.9092	
PV Unit electricity exported	-412.2910	0.1252	-51.6323	
Total			-119.5415	(269)
Total CO2, kg/year			1512.4388	(272)
EPC Target Carbon Dioxide Emission Rate (TER)			16.2300	(273)

13a. Primary energy - Individual heating systems including micro-CHP

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year	
Space heating - main system 1	4660.2083	1.1300	5266.0354	(275)
Total CO2 associated with community systems			0.0000	(473)
Water heating (other fuel)	2911.9897	1.1300	3290.5483	(278)
Space and water heating			8556.5837	(279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008	(281)
Energy for lighting	207.0900	1.5338	317.6415	(282)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-509.0377	1.4930	-759.9845	
PV Unit electricity exported	-412.2910	0.4597	-189.5126	
Total			-949.4971	(283)
Total Primary energy kWh/year			8054.8289	(286)
Target Primary Energy Rate (TPER)			86.4300	(287)